

In the Claims:

Please cancel claims 1-12, 21-32, and 41-52. This listing of claims replaces all prior versions.

1-60. (canceled)

61. (previously presented) An arrangement for controlling communication in a digital communication system having a plurality of communication lines on which signals are transmitted and received, the signals being affected by interference during transmission, the arrangement comprising:

means for creating a model of line, signal and interference characteristics of the communication lines based on signals actually carried by the communication lines; and

means for processing signals using the model to remove the actual interference from signals.

62. (canceled)

63. (previously presented) A method of controlling a digital communication system having a plurality of data-carrying communication lines wherein a line's available total power for use in the system is limited by a power constraint, the method comprising the steps of:

assigning the total power constraint for each line an initial value;

determining a competitively optimal data rate for each line by performing the steps of:

determining a power allocation within the total power constraint of each line by iteratively allowing each line to optimize its power allocation, and

determining the competitively optimal data rate for each line

based on the determined power allocation for the line;
creating a model of the line, signal and the actual interference characteristics of the communication lines; and
processing signals using the model to remove interference from signals including evaluating the competitively optimal data rate for each line.

64. (previously presented) The method of Claim 63 wherein evaluating the competitively optimal data rate for each line includes performing the steps of:

comparing the competitively optimal data rate of a line with a target rate for the line;
increasing the power constraint for a line if the competitively optimal data rate of the line is less than the target rate for the line;
decreasing the power constraint for the line if the competitively optimal data rate of the line exceeds the target rate for the line by at least a prescribed variance;
maintaining the power constraint for the line if the competitively optimal data rate of the line is equal to the target rate for the line; and
maintaining the power constraint for the line if the competitively optimal data rate of the line exceeds the target rate for the line by less than the prescribed variance.

65. (previously presented) The method of Claim 63 wherein the steps of determining a competitively optimal data rate for each line and evaluating the competitively optimal data rate for each line are repeated until no power constraint is increased or decreased.

66. (previously presented) The method of Claim 63 wherein the digital communication system is a DSL system.

67. (previously presented) The method of Claim 63 wherein the total power allowed each line is allocated among a plurality of frequencies.

68. (currently amended) The method of Claim 63, wherein the method is performed by a single entity.

69. (currently amended) The method of Claim 63, wherein the method is performed by the lines in a distributed fashion.

70. (previously presented) The method of Claim 63 wherein crosstalk interference is injected into the communication line by at least one of the other lines and wherein the crosstalk interference is considered by a line in the step of determining the power allocation of the line.

71. (previously presented) The method of Claim 63 wherein each line uses a modem having a power limit and wherein the power constraint of a line will not be increased to a level greater than the modem power limit irrespective of the competitively optimal data rate of the line.

72. (previously presented) A method of controlling a digital communication system having a plurality of data-carrying communication lines wherein a line's available total power for use in the system is limited by a power constraint, the method comprising:

assigning the total power constraint for each line an initial value;

determining a competitively optimal data rate for each by performing the steps

of:

determining a power allocation within the total power constraint of each line by iteratively allowing each line to optimize its power allocation, and

determining the competitively optimal data rate for each line
based on the determined power allocation for the line;
creating a model of the line, signal and the actual interference characteristics of
the communication lines; and
processing signals using the model to remove interference from signals including
evaluating the competitively optimal data rate for each line, by performing the steps of:
comparing the competitively optimal data rate of a line with a
target rate for the line;
increasing the power constraint for a line if the competitively
optimal data rate of the line is less than the target rate for the line;
decreasing the power constraint for the line if the competitively
optimal data rate of the line exceeds the target rate for the line by at least
a prescribed variance;
maintaining the power constraint for the line if the competitively
optimal data rate of the line is equal to the target rate for the line; and
maintaining the power constraint for the line if the competitively
optimal data rate of the line exceeds the target rate for the line by less
than the prescribed variance.

73. (previously presented) The method of Claim 72 wherein the steps of determining a competitively optimal data rate for each line and evaluating the competitively optimal data rate for each line are repeated until no power constraint is increased or decreased.

74. (previously presented) The method of Claim 72 wherein the digital communication system is a DSL system.

75. (previously presented) The method of Claim 72 wherein the total power allowed each line is allocated among a plurality of frequencies.

76. (currently amended) The method of Claim 72, wherein the method is performed by a single entity.

77. (currently amended) The method of Claim 72, wherein the method is performed by the lines in a distributed fashion.

78. (previously presented) The method of Claim 72 wherein crosstalk interference is injected into the communication line by at least one of the other lines and wherein the crosstalk interference is considered by a line in the step of determining the power allocation of the line.

79. (previously presented) The method of Claim 72 wherein each line uses a modem having a power limit and wherein the power constraint of a line will not be increased to a level greater than the modem power limit irrespective of the competitively optimal data rate of the line.

80. (previously presented) An arrangement for controlling a digital communication system having a plurality of data-carrying communication lines, wherein a line's available total power for use in the system is limited by a power constraint, the arrangement being adapted and programmed to perform the following steps:

 assigning the total power constraint for each line an initial value;

 determining a competitively optimal data rate for each by performing the following steps:

 determining a power allocation within the total power constraint of each line by iteratively allowing each line to optimize its power allocation, and

 determining the competitively optimal data rate for each line

based on the determined power allocation for the line;
creating a model of the line, signal and the actual interference characteristics of the communication lines; and
processing signals using the model to remove interference from signals including evaluating the competitively optimal data rate for each user, by performing the steps of:
 comparing the competitively optimal data rate of a line with a target rate for the line;
 increasing the power constraint for a line if the competitively optimal data rate of the line is less than the target rate for the line;
 decreasing the power constraint for the line if the competitively optimal data rate of the line exceeds the target rate for the line by at least a prescribed variance;
 maintaining the power constraint for the line if the competitively optimal data rate of the line is equal to the target rate for the line; and
 maintaining the power constraint for the line if the competitively optimal data rate of the line exceeds the target rate for the line by less than the prescribed variance.

81. (previously presented) The arrangement of Claim 80 wherein the steps of determining a competitively optimal data rate for each line and evaluating the competitively optimal data rate for each line are repeated until no power constraint is increased or decreased.

82. (previously presented) The arrangement of Claim 80 wherein the digital communication system is a DSL system.

83. (previously presented) The arrangement of Claim 80 wherein the total power allowed each line is allocated among a plurality of frequencies.

84. (currently amended) The arrangement of Claim 80, wherein the arrangement is performed by a single entity.

85. (currently amended) The arrangement of Claim 80, wherein the arrangement is performed by the lines in a distributed fashion.

86. (previously presented) The arrangement of Claim 80 wherein crosstalk interference is injected into the communication line by at least one of the other lines and wherein the crosstalk interference is considered by a line in the step of determining the power allocation of the line.

87. (previously presented) The arrangement of Claim 80 wherein each line uses a modem having a power limit and wherein the power constraint of a line will not be increased to a level greater than the modem power limit irrespective of the competitively optimal data rate of the line.